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Omae et al.

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(54) **SHIELD CONNECTOR**

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H01R 4/66 (2006.01)

(52) **U.S. Cl.**
USPC **439/98**

(58) **Field of Classification Search**
USPC 439/98, 99, 607.41, 559; 174/652, 78
See application file for complete search history.

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(57) **ABSTRACT**

A shield connector includes a housing and a shield terminal. The housing, has a tubular shape so that a shield electric wire is inserted thereinto, and is attached to an objective body so as to communicate with an insert hole of the objective body. The shield terminal, has a tubular shape, is electrically conductive, is attached to an inner peripheral side of the housing, and is electrically conducted to the objective body and the shield layer. A seal member having a tubular shape is provided between an inner periphery of the insert hole and the shield electric wire and between the shield terminal and the shield electric wire, so as to seal a part between the inner periphery of the insert hole and an outer periphery of the shield electric wire and a part between an inner periphery of the shield terminal and the outer periphery of the shield electric wire.

4 Claims, 9 Drawing Sheets

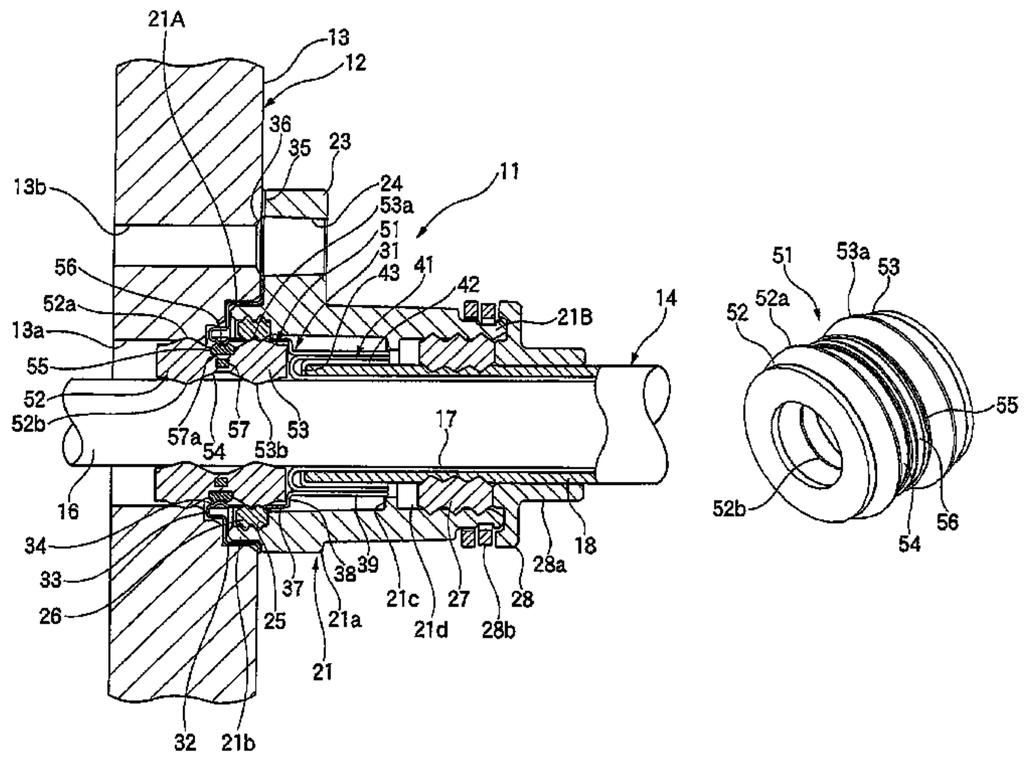
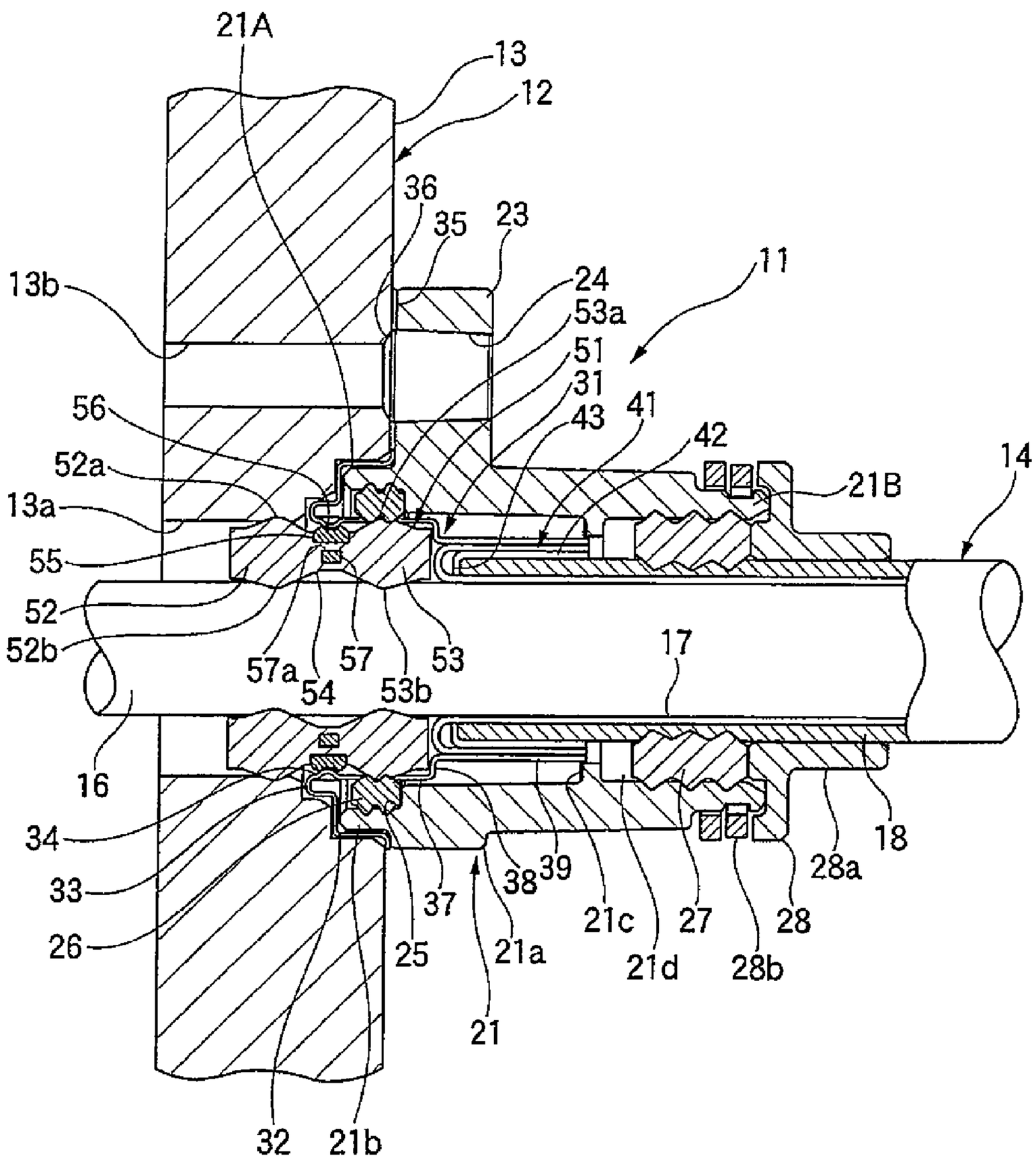


Fig. 1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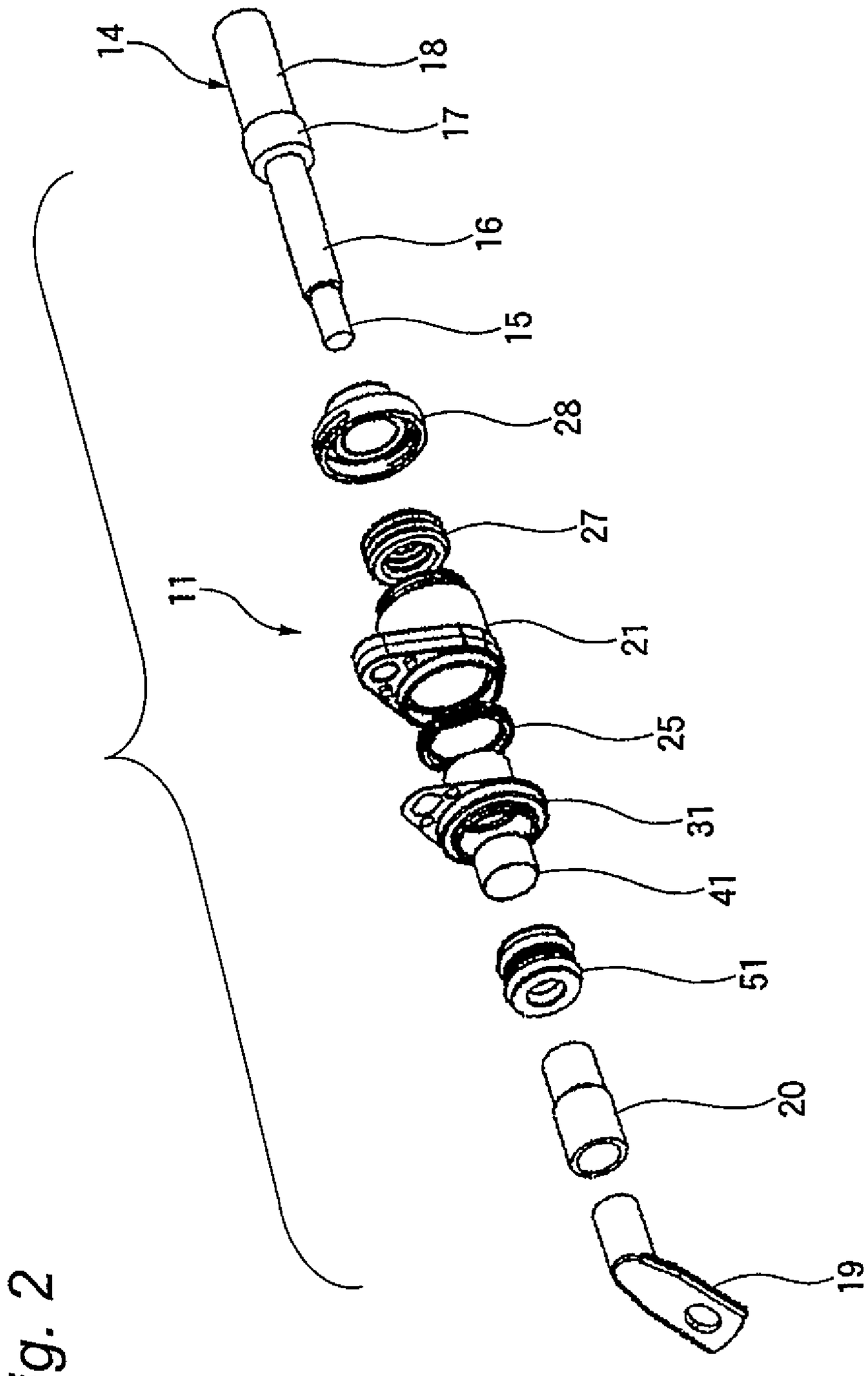


Fig. 2

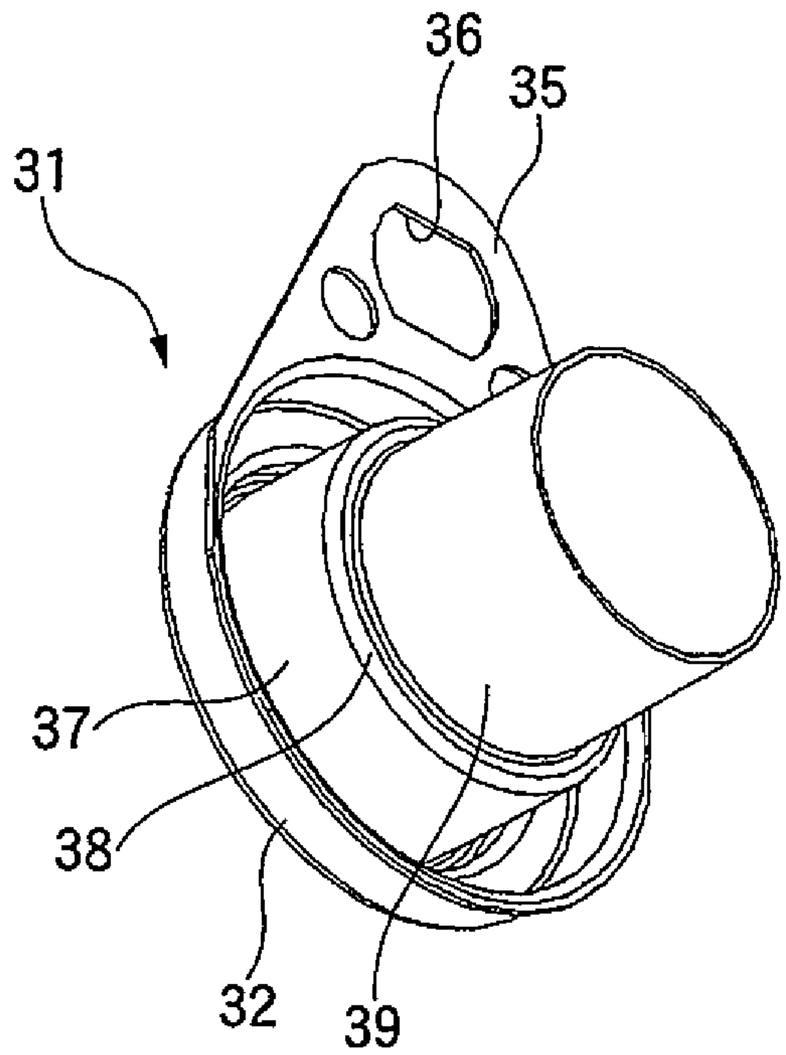


Fig. 3A

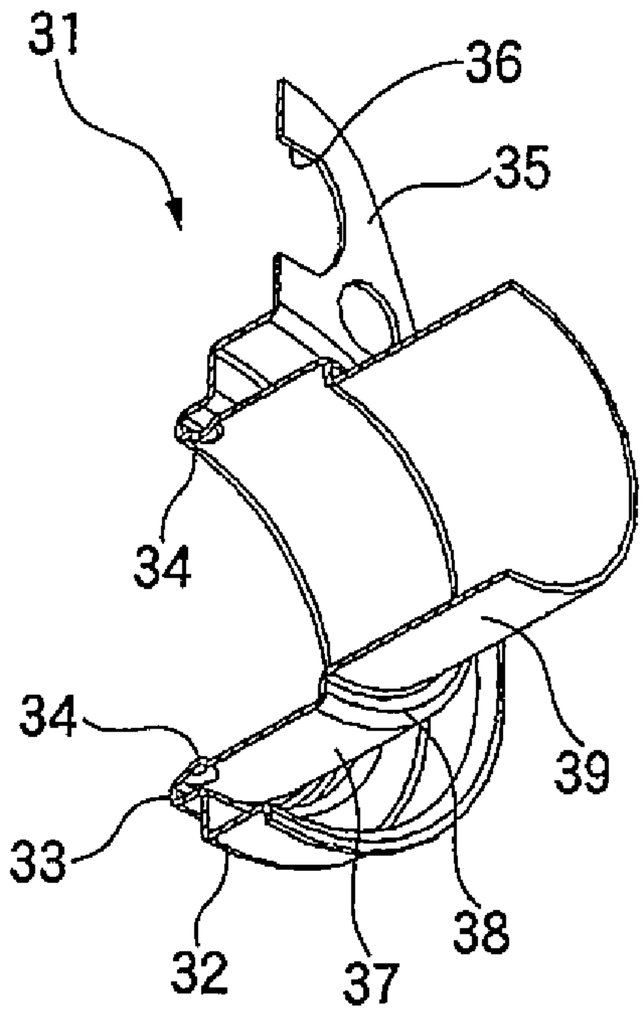
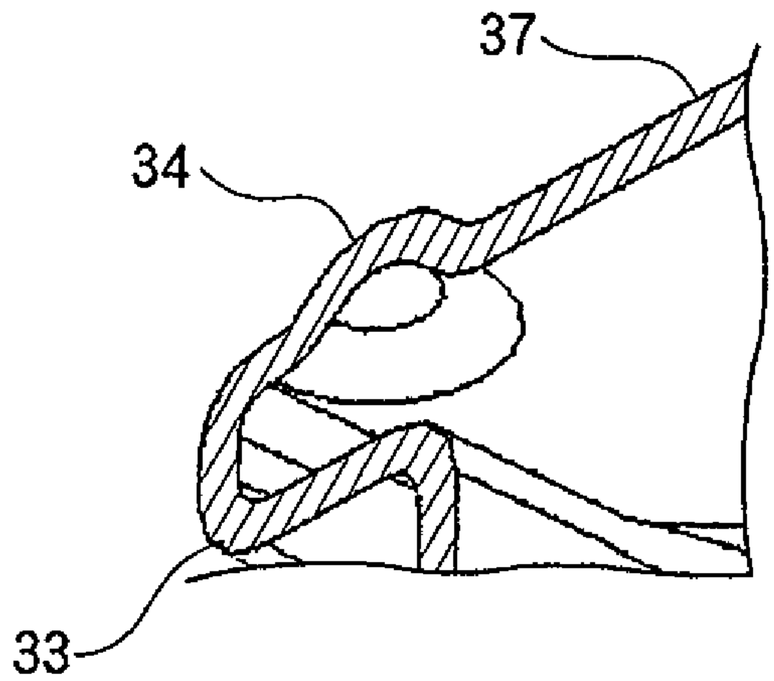


Fig. 3B

Fig. 4



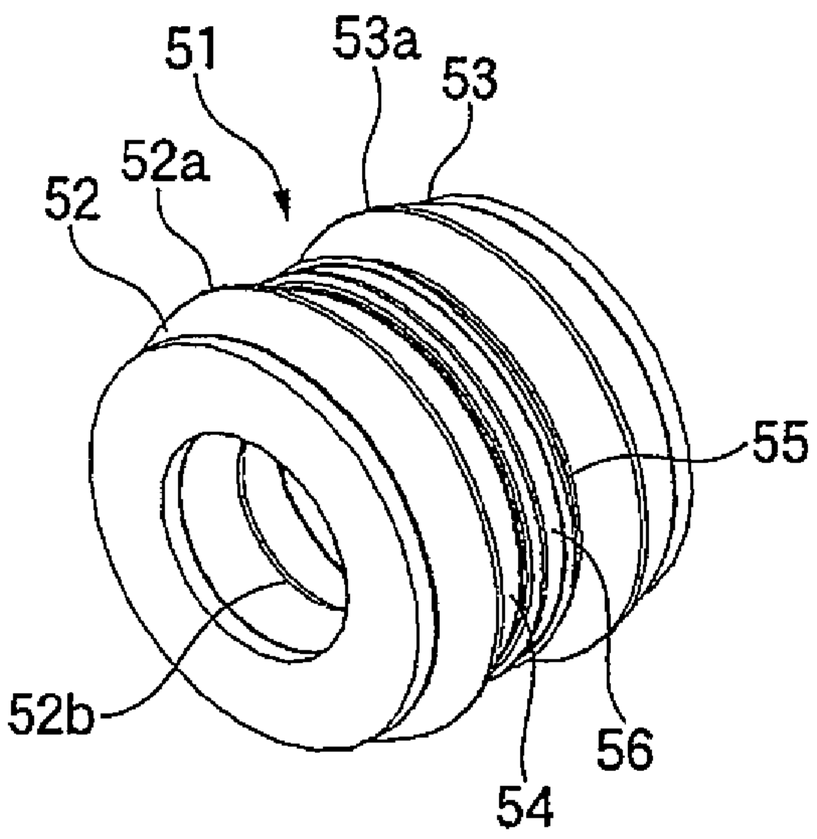


Fig. 5A

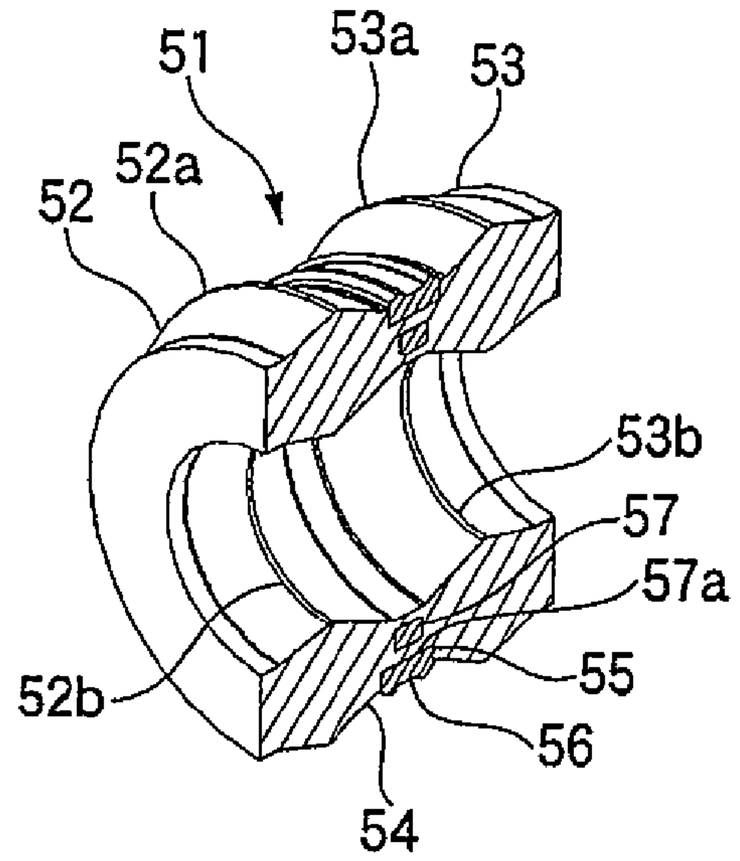
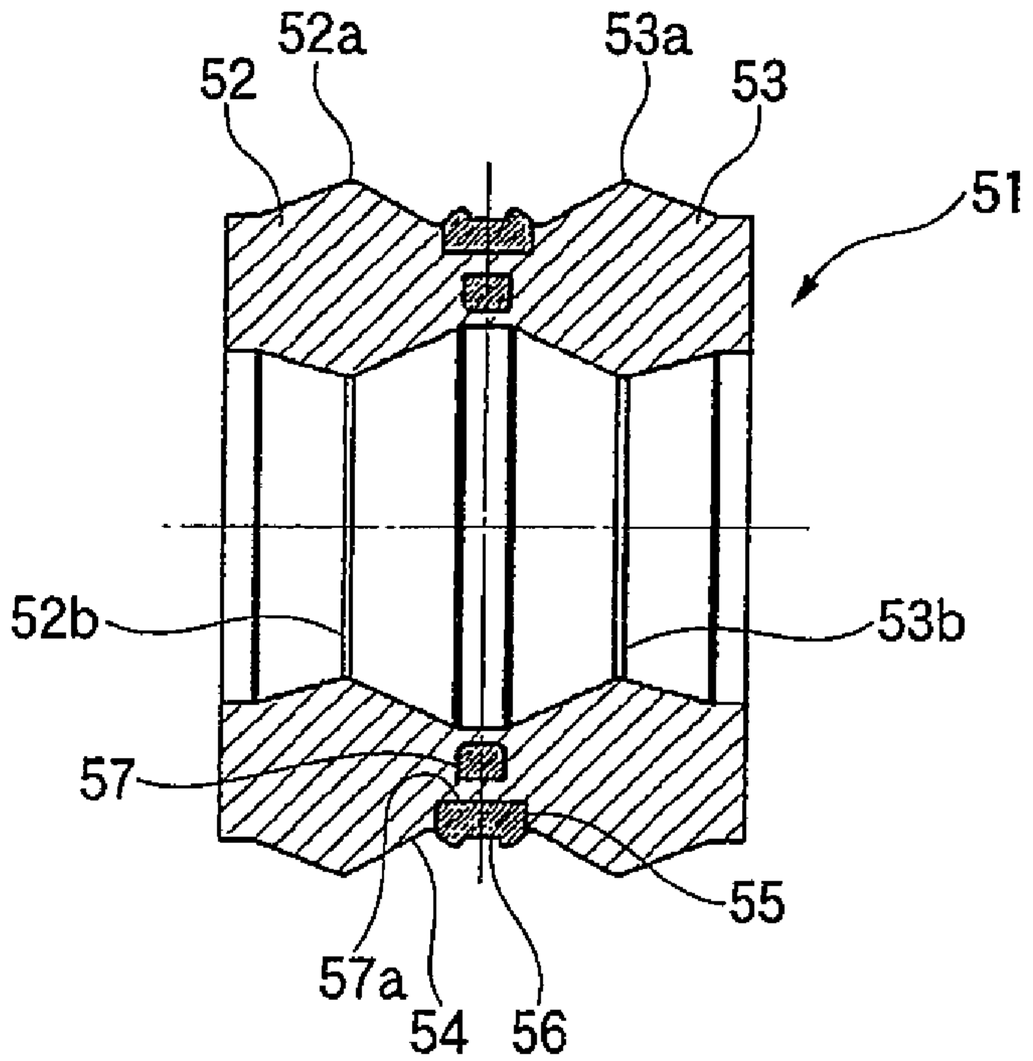


Fig. 5B

Fig. 6



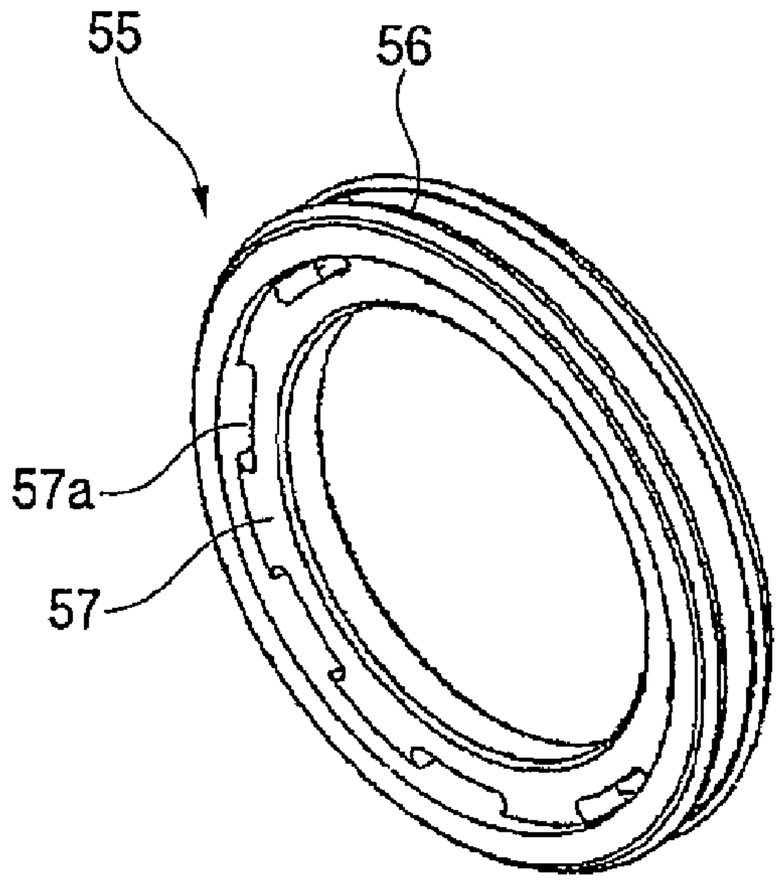


Fig. 7A

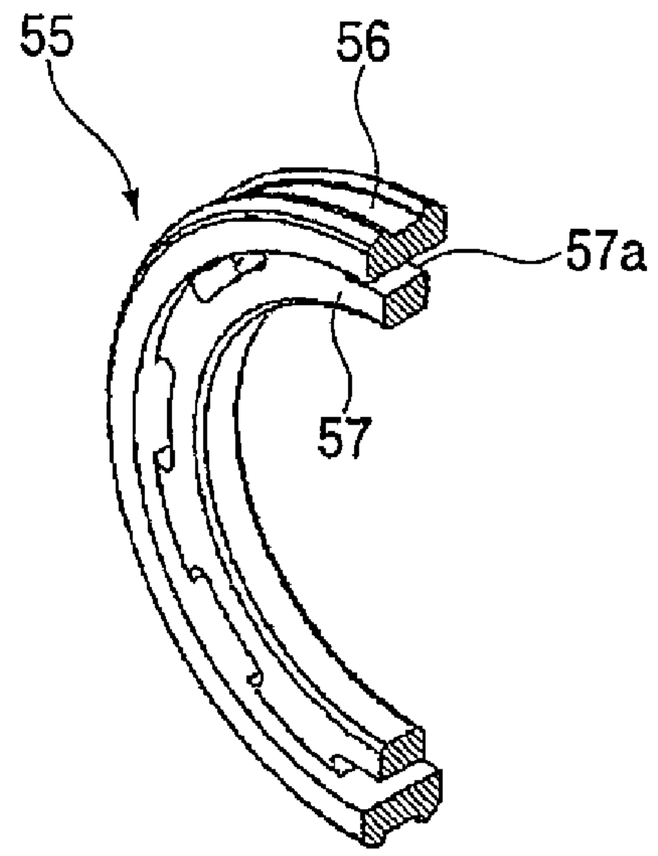


Fig. 7B

Fig. 8

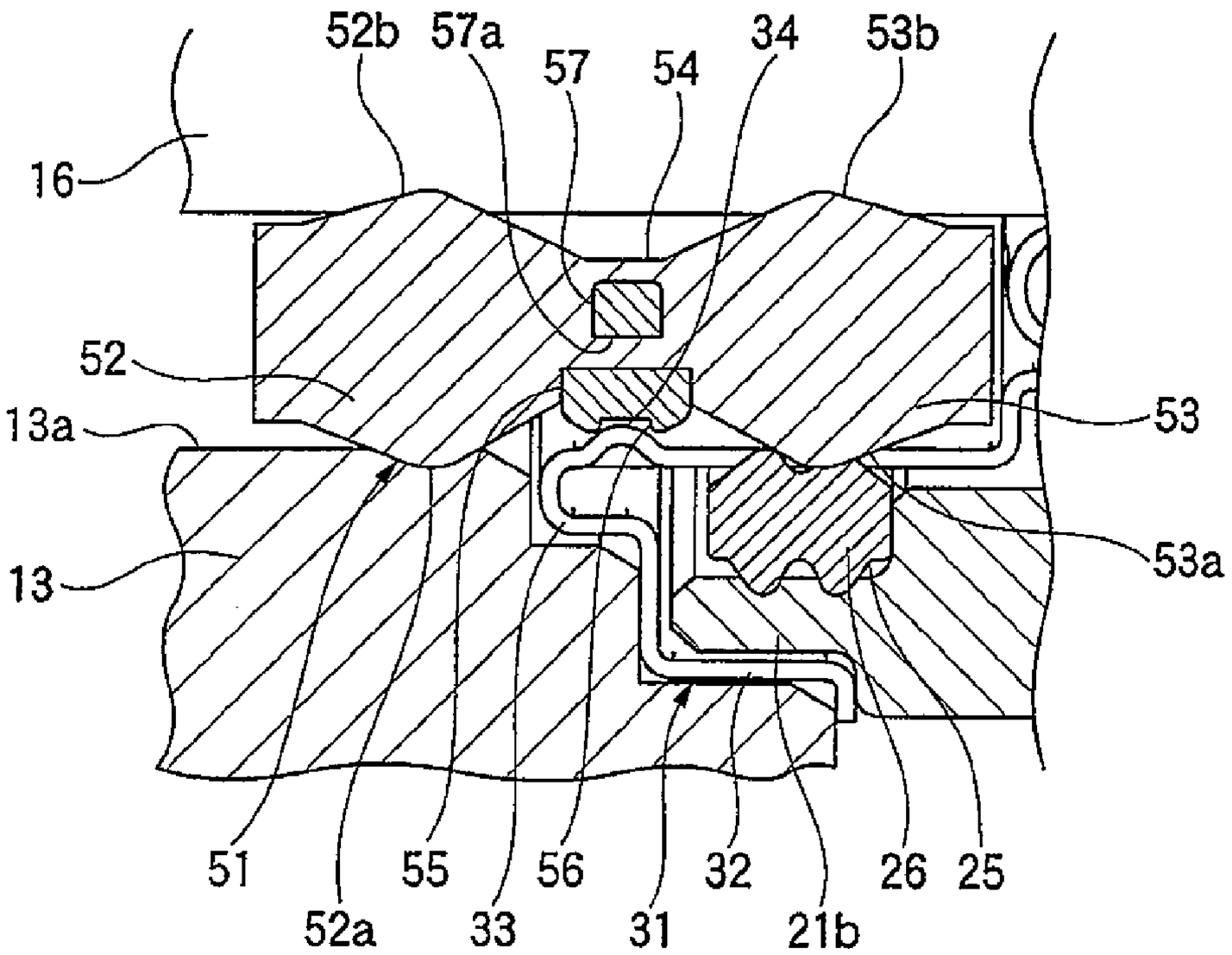


Fig. 9

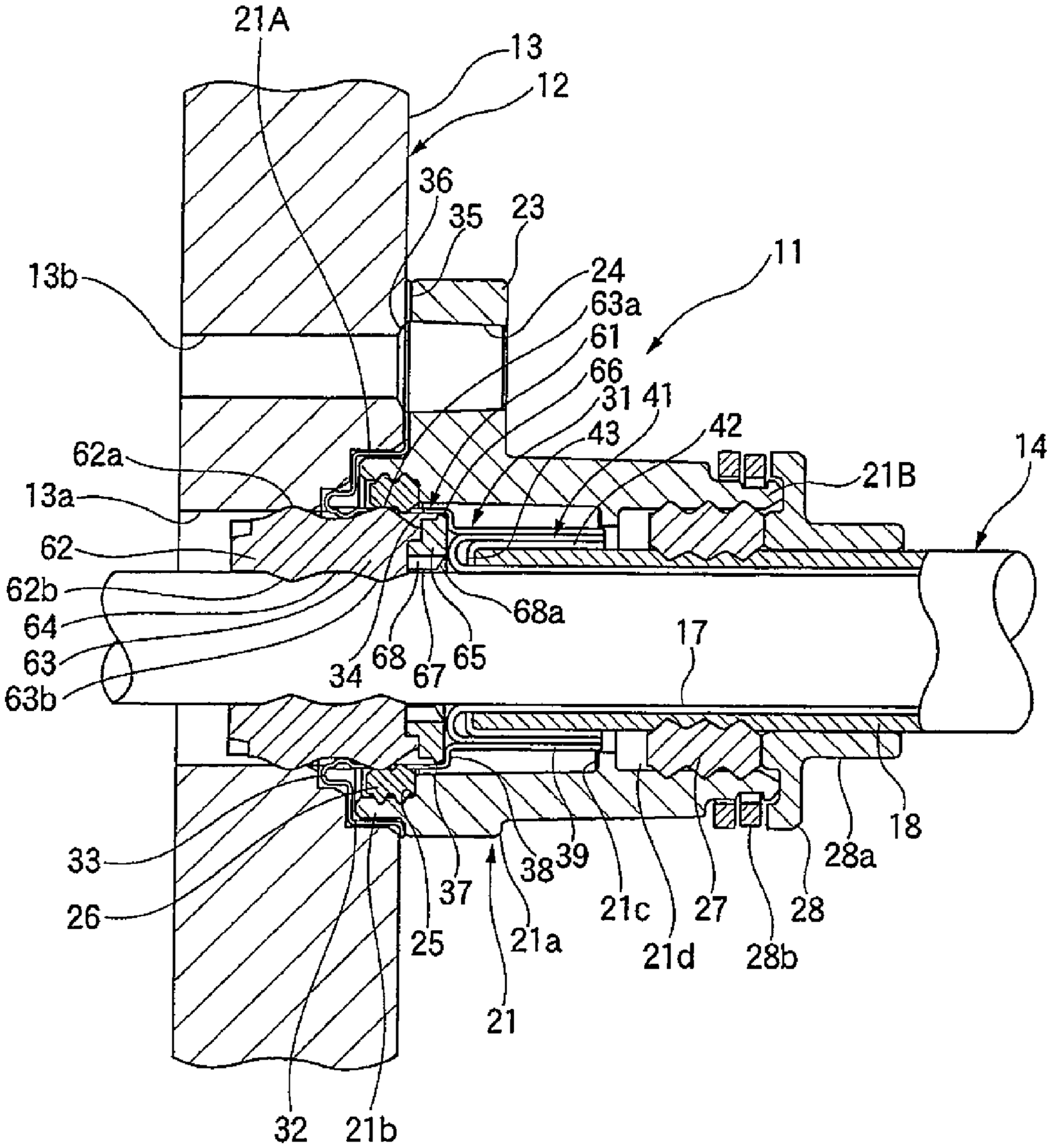

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Fig. 10

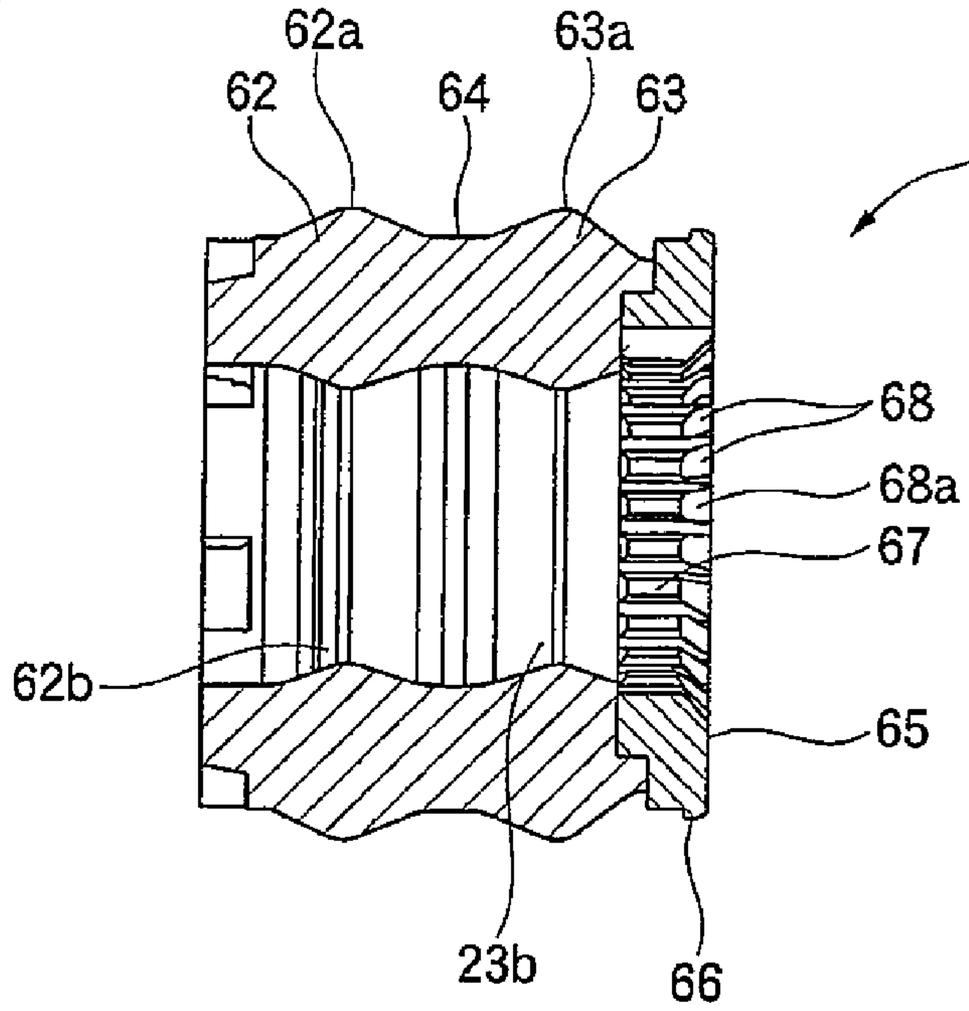


Fig. 11A

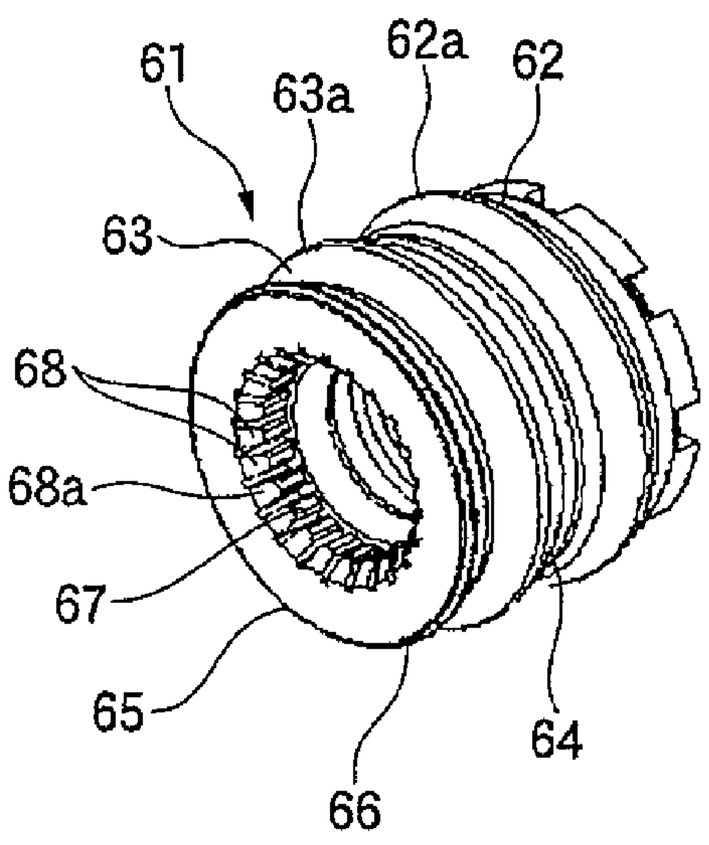
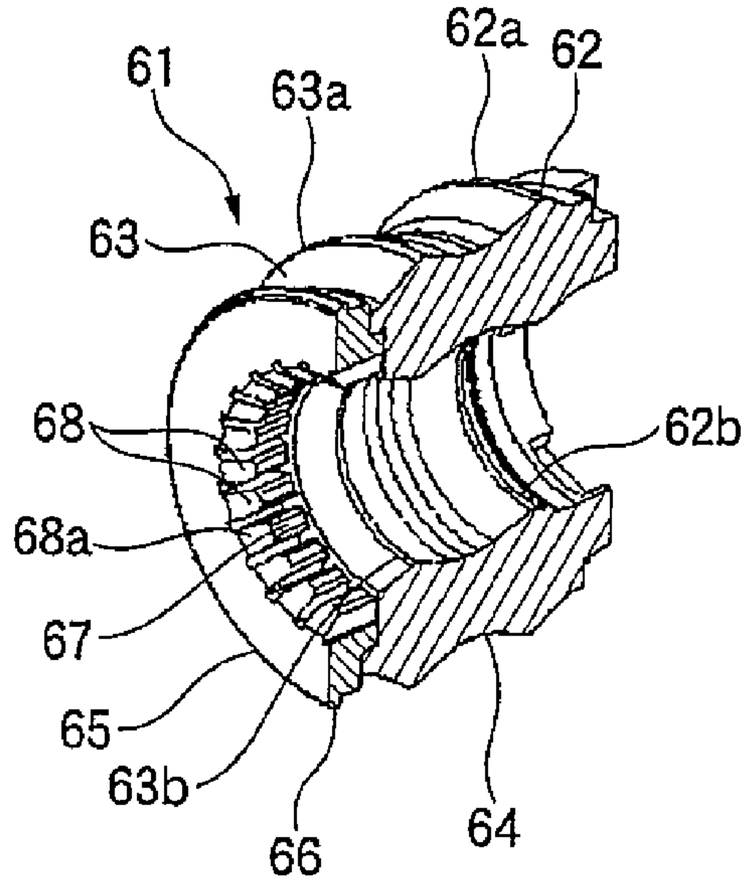


Fig. 11B



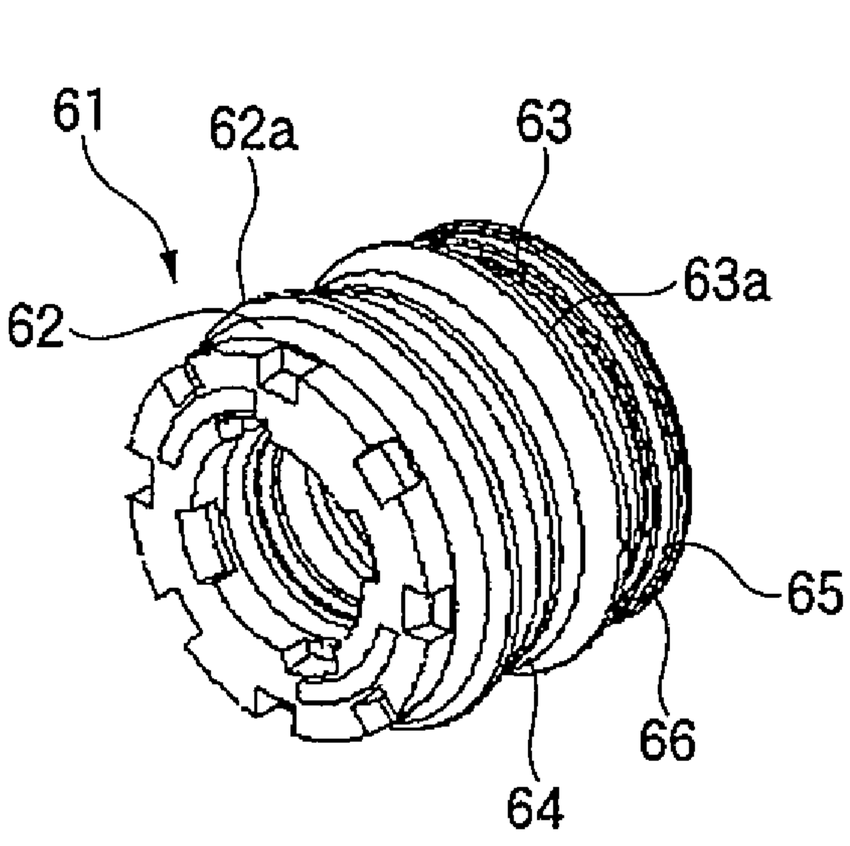


Fig. 12A

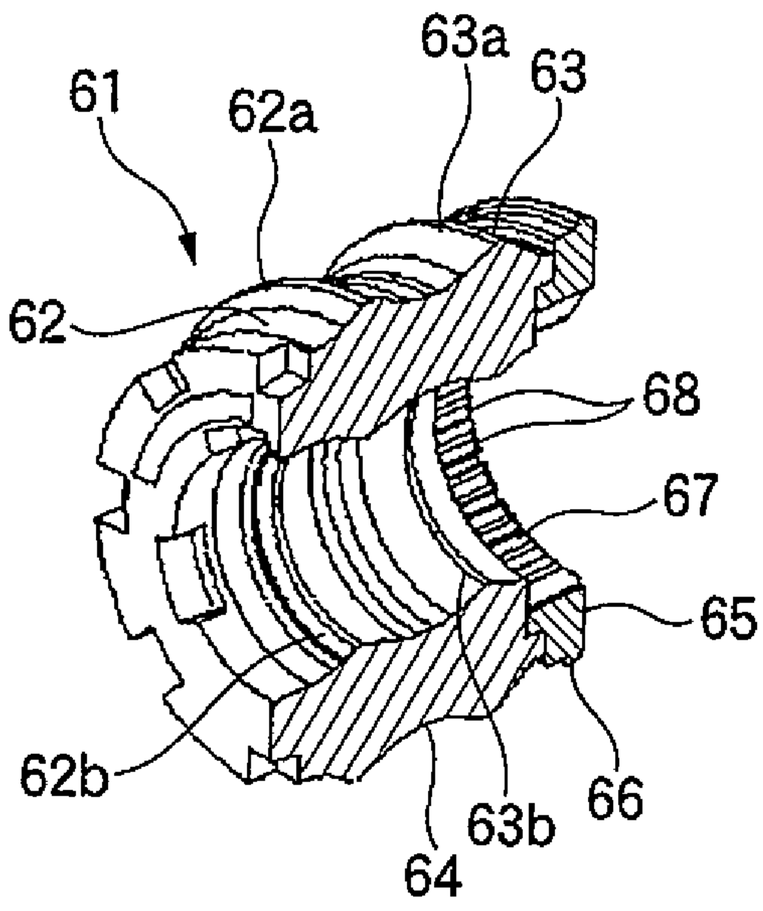


Fig. 12B

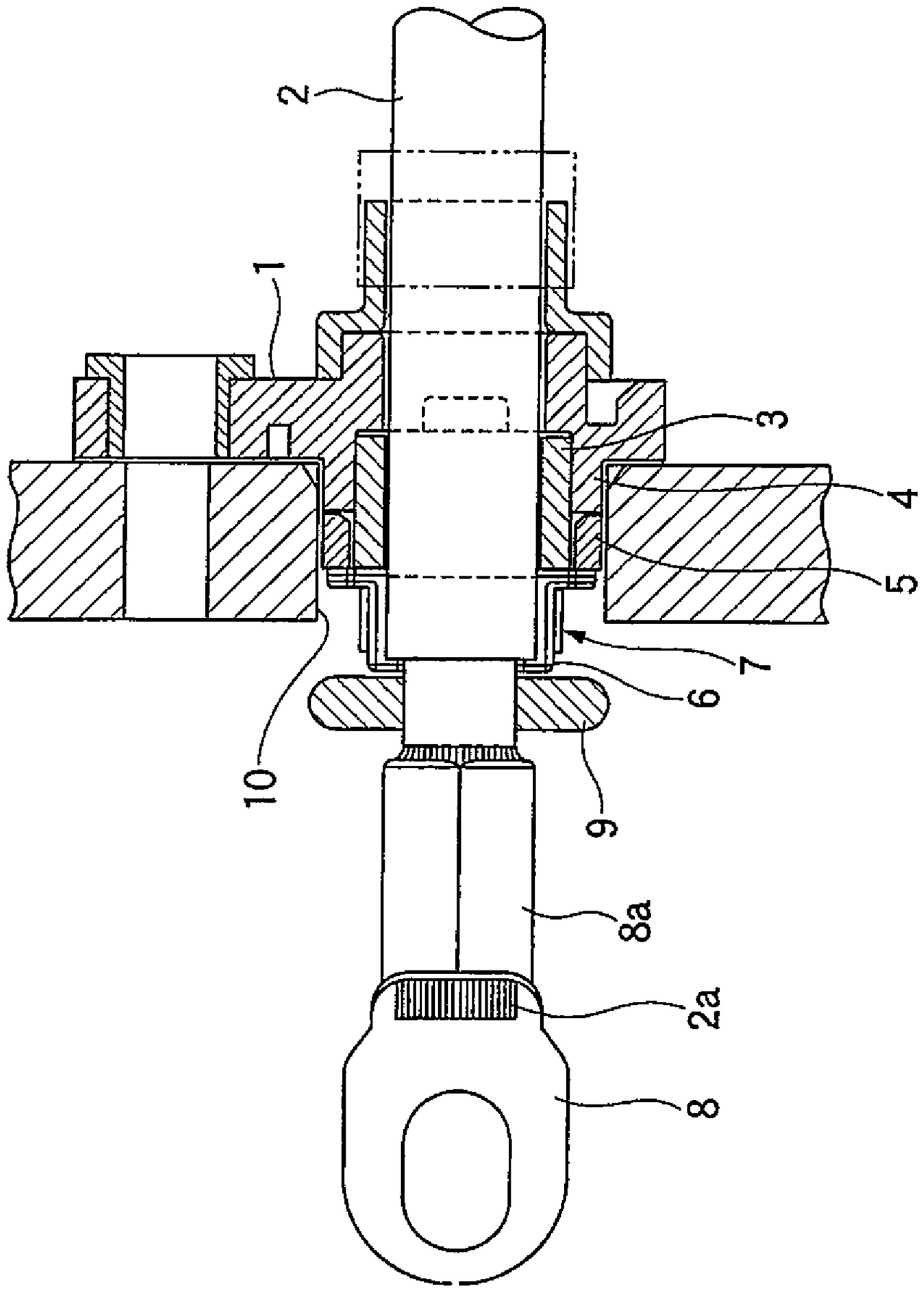


Fig. 13

SHIELD CONNECTOR

TECHNICAL FIELD

The present invention is related to a shield connector that connects a shield electric wire to an objective body, and more particularly to a shield connector used for ground connecting the shield electric wire to a body of a motor vehicle.

BACKGROUND ART

For instance, for an electric wire used in a wire harness mounted on a vehicle, a shield electric wire that prevents an influence by an external noise of an electromagnetic wave is used. And the shield electric wire prevents a radiation noise of an electromagnetic wave from leaking to an external part from the electric wire. A core wire of the shield electric wire is shielded by a shield layer such as a braided part. The shield layer is electrically connected to a common ground part in the vehicle, or ground connected to an objective body which is the common ground part itself.

As the shield connector used for connecting the shield electric wire, a conventional shield connector shown in FIG. **13**, is known. In the conventional shield connector, a shield electric wire **2** is inserted into a housing **1**, a first seal member **3** is attached to the housing **1**, then, a shield member **4** is attached to the housing **1**, further a second seal member **5** is attached on the shield member **4**, a shield layer **6** of the shield electric wire **2** is folded back to the shield member **4**, and then, the shield layer **6** and the shield member **4** are crimped by a shield sleeve **7** to have an ground connection (see PTL 1).

Citation List

Patent Literature

[PTL 1] JP-A-2000-294344

SUMMARY OF INVENTION

Technical Problem

Since the conventional shield connector includes the first seal member **3** that seals a part between the shield electric wire **2** and the shield member **4** and the second seal member **5** that seals a part between the shield connector and an attaching hole **10**, the number of parts is increased, so that the shield connector is enlarged. Thus, the attaching hole **10** for attaching the shield connector may be possibly enlarged to deteriorate a shield performance.

Further, in the above-described shield connector, since the shield member **4** provided in the folded back part of the shield layer **6** is provided at a position close to a crimping part **8***a* of a terminal **8** connected to core wires **2***a* of the shield electric wire **2**, another member such as a cushion ring **9** needs to be provided between the shield member **4** and the crimping part **8***a* of the terminal **8**. Thus, the number of parts is more increased to cause a high cost.

In this case, to omit another member such as cushion ring **9**, the crimping part **8***a* of the terminal **8** may be supposed to be separated from the shield member **4** to ensure a creeping distance. However, when the crimping part **8***a* is separated from the shield member **4**, a device to which the terminal **8** is connected also needs to be separated from an attaching position of the shield connector. Thus, an entire part of the device is caused to be enlarged.

It is therefore one advantageous aspect of the present invention to provide a shield connector which can obtain a high shield performance and a high sealing performance without enlarging the shield connector and increasing a cost.

Solution to Problem

According to one aspect of the invention, there is provided a shield connector, to which a shield electric wire including an inner sheath, a shield layer and an outer sheath provided in this order in a periphery of a core wire is connected, attached to a grounded objective body to guide the shield electric wire to an insert hole formed in the objective body, and electrically conducting current from the shield layer to the objective body, the shield connector comprising:

a housing, having a tubular shape so that the shield electric wire is inserted thereinto, and attached to the objective body so as to communicate with the insert hole of the objective body;

a shield terminal, having a tubular shape, being electrically conductive, attached to an inner peripheral side of the housing, and electrically conducted to the objective body and the shield layer; and

a seal member, having a tubular shape, provided between an inner periphery of the insert hole and the shield electric wire and between the shield terminal and the shield electric wire, and configured to seal a part between the inner periphery of the insert hole and an outer periphery of the shield electric wire and a part between an inner periphery of the shield terminal and the outer periphery of the shield electric wire.

The shield connector may be configured such that: an annular member made of a resin is provided integrally in the seal member, and the annular member is engaged with the shield terminal.

The annular member may be provided in an intermediate part of the seal member in an axial direction of the seal member.

The annular member may have a true circle forming part configured to forcibly form an outer form of the inserted shield electric wire to a true circle.

In the shield connector having the structure of the present invention, since the tubular seal member is provided that simultaneously seals the part between the inner periphery of the insert hole of the objective body and the outer periphery of the shield electric wire and the part between the inner periphery of the shield terminal and the outer periphery of the shield electric wire, a cost can be more lowered by the decrease of the number of component parts than a case that seal members for sealing the above-described parts are respectively provided. Further, an inconvenience can be eliminated that the plurality of seal members are used to enlarge the insert hole of the objective body and deteriorate a shield performance.

Further, when a terminal is fixed to the core wire exposed in an end part of the shield electric wire, a separate member made of an insulating material is not provided between the shield terminal and the terminal, nor the shield terminal is greatly separated from the terminal so that an insulation between the shield terminal and the terminal may be ensured by the seal member and the shield performance may be improved. Thus, the increase of the cost due to a provision of the separate parts can be suppressed and an inconvenience can be eliminated that the shield terminal is greatly separated from the terminal to lead to an enlargement.

In the shield connector having the structure of the present invention, since the annular member made of the resin and formed integrally with the seal member is engaged with the

shield terminal, the seal member can be held at a prescribed position and a good sealing state by the seal member can be maintained.

In the shield connector having the structure of the present invention, since the annular member which is engaged with the shield terminal is provided in the intermediate part of the seal member in the axial direction, the seal member can be held at the prescribed position with a good balance and the good sealing state can be obtained.

In the shield connector having the structure of the present invention, since the shield electric wire is inserted into the seal member, even when the shield electric wire is somewhat deformed, the outer form of the shield electric wire can be configured to the true circle by the true circle forming part of the annular member. Thus, the seal member can be allowed to come into close contact with the outer periphery of the shield electric wire with a good balance to obtain a good sealing state.

Advantageous Effects of Invention

According to the present invention, the shield connector may be provided which can obtain a high shield performance and a high sealing performance without enlarging the shield connector and increasing the cost.

BRIEF DESCRIPTION OF DRAWINGS

FIG. **1** is a sectional view of a shield connector according to a first embodiment.

FIG. **2** is an exploded perspective view of the shield connector according to the first embodiment.

FIG. **3**A is a perspective view showing a shield terminal forming the shield connector.

FIG. **3**B is a sectional perspective view showing the shield terminal forming the shield connector.

FIG. **4** is a perspective view of the shield terminal forming the shield connector with a part seen in section.

FIG. **5**A is a perspective view showing a seal member forming the shield connector.

FIG. **5**B is a sectional perspective view showing the seal member forming the shield connector.

FIG. **6** is a sectional view of the seal member forming the shield connector.

FIG. **7**A is a perspective view showing an annular member provided in the seal member.

FIG. **7**B is a sectional perspective view showing the annular member provided in the seal member.

FIG. **8** is a sectional view of a part of the shield connector showing an engaged state of a recessed part and a protruding part of the shield terminal and the seal member.

FIG. **9** is a sectional view of a shield connector according to a second embodiment.

FIG. **10** is a sectional view of a seal member forming the shield connector.

FIG. **11**A is a perspective view from an inserting side showing the seal member forming the shield connector.

FIG. **118** is a sectional perspective view from the inserting side showing the seal member forming the shield connector.

FIG. **12**A is a perspective view from an attaching side showing the seal member forming the shield connector.

FIG. **12**B is a perspective view seen in section from the attaching side showing the seal member forming the shield connector.

FIG. **13** is a sectional view for explaining a usual example of a shield connector.

DESCRIPTION OF EMBODIMENTS

Now, embodiments according to the present invention will be described below by referring to the drawings.

Initially, a shield connector according to a first embodiment will be described below.

FIG. **1** is a sectional view of the shield connector according to the first embodiment. FIG. **2** is an exploded perspective view of the shield connector according to the first embodiment.

As shown in FIGS. **1** and **2**, a shield connector **11** is attached to a case (an objective body) **13** of a device **12** such as a motor unit provided in a vehicle such as a motor vehicle to guide a shield electric wire **14** forming a wire harness to the device **12** from an insert hole **13***a* formed in the case **13**.

The shield electric wire **14** has a structure that a core wire **15** is coated with an inner sheath **16** as an insulating material, the inner sheath **16** is coated with a shield layer **17** as a braided part which is a mesh shaped electrically conductive material, and the shield layer **17** is coated with a sheath which is an outer sheath **18** as an insulating material. Then, in the shield electric wire **14**, a part of the outer sheath **18** is cut by a cutter in the vicinity of the shield connector **11** to expose the shield layer **17**, and further, the shield layer **17** is cut by the cutter so that the shied layer **17** has a prescribed length. Thus, the inner sheath **16** is exposed. Then, in the shield electric wire **14**, a crimping terminal **19** is crimped and connected to the core wire **15** exposed from the inner sheath **16**, and a crimped part thereof is coated with a thermally shrinking tube **20**.

The shield connector **11** includes a housing **21**. The housing **21** is made of an insulating material such as a synthetic resin and formed in a cylindrical shape. The shield electric wire **14** is inserted into the housing **21**. The housing **21** has one end side set as an attaching side **21**A and the other end side set as a cable inserting side **21**B. In the housing **21**, the attaching side **21**A is attached to the case **13** of the device **2** and the shield electric wire **14** is inserted from the cable inserting side **21**B.

In the vicinity of the attaching side **21**A of the housing **21**, a flange part **21***a* is formed that protrudes to an outer periphery side and a strength is increased. The attaching side **21**A from the flange part **21***a* is formed as an annular protruding part **21***b*. The flange part **21***a* has a mountain shaped attaching piece **23** in a part and an attaching hole **24** is formed substantially at a central part of the attaching piece **23**. Into the attaching hole **24**, a fastening tool such as a bolt can be inserted. The bolt is inserted into the attaching hole **24** and screwed to a tapped hole **13***b* formed in the case **13** of the device **2**, so that the housing **21** is fastened and fixed to the case **13** together with a fixing piece **35** of a below-described shield terminal **31**.

In the annular protruding part **21***b* of the attaching side **21**A of the housing **21**, a stepped part **25** is formed in an inner periphery side. An inner seal **26** formed in an annular shape is fitted to the stepped part **25**. A part between the housing **21** and the below described shield terminal **31** is sealed by the inner seal **26**.

Further, in the housing **21**, an annular rib **21** is formed which protrudes over a circumferential direction in an inner periphery in an intermediate part of the axial direction. The cable inserting side **21**B from the annular rib **21***c* in the inner peripheral side of the housing **21** is formed as a seal accommodating part **21***d*.

Then, to the seal accommodating part **21***d*, a wire seal **27** is fitted. A part between the shield electric wire **14** and the housing **21** is sealed by the wire seal **27** in the cable inserting side **21**B of the housing **21**.

To the cable inserting side **21**B of the housing **21**, a rubber stopper **28** is attached. The rubber stopper **28** includes a tubular stopper main body **28***a* into which the shield electric wire **14** is inserted and a cover part **28***b* provided integrally in an outer peripheral side of the stopper main body **28***a* and covering the cable inserting side **21**B of the housing **21**. Then, the inserting side **21**B as a rear end of the housing **21** is further sealed by the rubber stopper **28** and the wire seal **27** is prevented from slipping out.

To the attaching side **21**A of the housing **21**, the shield terminal **31** is attached. The shield terminal **31** is formed by press working an electrically conductive metal plate. As shown in FIGS. **3**A and **3**B, the shield terminal **31** includes a ring shaped protruding part **32** bent so as to cover the annular protruding part **21***b* and the inner seal **26** in the attaching side **21**A from the flange part **21***a*.

Further, the ring shaped protruding part **32** of the shield terminal **31** has an inner peripheral side formed as an annular engaging protrusion **33** protruding to the case **13** side. As shown in FIG. **4**, in the annular engaging protrusion **33**, two engaging protrusions **34** protruding to a central side are formed at opposed positions in an inner peripheral surface thereof.

In the ring shaped protruding part **32** of the shield terminal **31**, a mountain shaped fixing piece **35** is formed on a part of an outer periphery thereof. The fixing piece **35** is formed substantially in the same outer shape as that of the attaching piece **23** of the housing **21**. In the fixing piece **35**, an attaching hole **36** is formed that has substantially the same form and the same size as the form and the size of the attaching hole **24** provided in the attaching piece **23**. Then, the attaching piece **23** of the housing **21** is overlapped on the fixing piece **35** of the shield terminal **31**, a bolt or a screw made of metal is inserted through the attaching holes **24** and **36** which communicate with each other and fastened to the tapped hole **13***b* of the case **13**. Thus, the fixing piece **35** of the shield terminal **31** is fixed to the case **13** of the device **12** together with the attaching piece **23** of the housing **21**. Thus, the shield terminal **31** is electrically conducted to the case **13** of the device **12**.

Further, the shield terminal **31** includes, in an inner peripheral edge of the ring shaped protruding part **32**, a tubular part **37** continuous in parallel with a central line of the housing **21** and a tubular crimping part **39** continuous to the tubular part **37** in parallel with the central line of the housing **21** through a stepped part **38** and having a diameter smaller than that of the tubular part **37**.

An end part of the tubular crimping part **39** is opened. When the shield terminal **31** is attached to the housing **21**, the end part of the crimping part **39** is located in the vicinity of the annular rib **21***c*.

In the shield terminal **31**, a shield sleeve **41** is provided in an inner peripheral side thereof. The shield sleeve **41** is made of an electrically conductive metal tubular body and formed by a pressing work. An inside diameter of the shield sleeve **41** is substantially equal to an outside diameter of the outer sheath **18** of the shield electric wire **14**. Accordingly, the inside diameter of the shield sleeve has a size that comes close contact with a dimension of the outside diameter of the shield electric wire **14** inserted into the housing **21**, that is, an outer periphery of the outer sheath **18**. The shield sleeve **41** includes a tubular part **42** having the same diameter over an entire length and a diameter reduced piece **43** bent substantially at right angles to a center of the shield sleeve **41** in an end of the tubular part **42**. In the diameter reduced piece **43**, an outer surface of a corner part continuous to the tubular part **42** forms a smooth circular arc surface.

Then, the tubular part **42** of the shield sleeve **41** is inserted to the outer periphery of the outer sheath **18** so that the diameter reduced piece **43** of the shield sleeve **41** is engaged with a cut end of the outer sheath **18** of the shield electric wire **14**. On the other hand, on the tubular part **42** of the shield sleeve **41** covering the outer sheath **18**, the shield layer **17** of the prescribed length which is cut by the cutter and left is folded back so as to cover the diameter reduced piece **43** from an outer part.

The shield layer **17** folded back on the tubular part **42** is inserted into the crimping part **39** of the shield terminal **31**. The crimping part **39** applies a crimping force from an outer periphery of the crimping part **39**, so that the crimping part **39** integrally holds the shield electric wire **14** including the outer sheath **18**, the shield layer **17**, the inner sheath **16** and the core wire **15** in the housing **12** through the shield layer **17** and the shield sleeve **41**.

In the case **13** side of the shield terminal **31**, a seal member **51** formed in a tubular shape is provided. The seal member **51** is formed with, for instance, an elastic material such as rubber. As shown in FIGS. **5**A and **5**B and FIG. **6**, the seal member **51** has two annular seal parts **52** and **53** whose thickness is large. The seal part **52** has lip parts **52***a* and **52***b* which gradually protrude to an outer peripheral side and an inner peripheral side. The seal part **53** also has lip parts **53***a* and **53***b* which gradually protrude to an outer peripheral side and an inner peripheral side similarly to the seal part **52**.

The seal member **51** has a part between the seal parts **52** and **53** as an intermediate part in the axial direction formed as a compressed part **54** whose thickness is reduced. In the intermediate part of the seal member **51** formed as the compressed part **54**, an annular member **55** is integrally provided. The seal member **51** is symmetrically formed with respect to the intermediate part in the axial direction as a boundary where the annular member **55** is provided.

The annular member **55** is formed with a synthetic resin such as plastic. As shown in FIGS. **7**A and **7**B, in an outer peripheral side of the annular member **55**, an engaging groove **56** is formed in the circumferential direction. Further, in an inner peripheral surface side of the annular member **55**, a rib **57** is formed in the circumferential direction. In the rib **57**, a plurality of hole parts **57***a* are formed at prescribed intervals in the circumferential direction. The rubber that forms the seal member **51** enters the hole parts **57***a*. Thus, the annular member **55** is strongly embedded in the rubber that forms the seal member **51**. Further, in the annular member **55**, the outer peripheral part having the engaging groove **56** is not embedded in the seal member **51** and exposed.

In the seal member **51**, the seal part **52** is arranged between the insert hole **13***a* of the case **13** and the inner sheath **16** of the shield electric wire **14**, the lip part **52***a* of the seal part **52** is allowed to come into close contact with an inner peripheral surface of the insert hole **13***a* and the lip part **52***b* of the seal part **52** is allowed to come into close contact with an outer peripheral surface of the inner sheath **16**. Thus, a part between the insert hole **13***a* of the case **13** and the inner sheath **16** of the shield electric wire **14** is sealed by the seal part **52** of the seal member **51**.

Further, in the seal member **51**, the seal part **53** is arranged between the tubular part **37** of the shield terminal **31** and the inner sheath **16** of the shield electric wire **14**, the lip part **53***a* of the seal part **53** is allowed to come into close contact with an inner peripheral surface of the tubular part **37** and the lip part **53***b* of the seal part **53** is allowed to come into close contact with an outer peripheral surface of the inner sheath **16**. Thus, a part between the tubular part **37** of the shield

terminal **31** and the inner sheath **16** of the shield electric wire **14** is sealed by the seal part **53** of the seal member **51**.

In such a way, the seal member **51** has a function that simultaneously seals the part between the inner periphery of the insert hole **13***a* and the outer periphery of the inner sheath **16** of the shield electric wire **14** and the part between the inner periphery of the tubular part **37** of the shield terminal **31** and the outer periphery of the inner sheath **16** of the shield electric wire **14**.

Further, as shown in FIG. **8**, the engaging protrusions **34** formed in the annular engaging protrusion **33** of the shield terminal **31** are respectively engaged, in an engagement of recessed and protruding parts, with the engaging groove **56** of the annular member **55** provided in the compressed part **54** of the seal member **51**. Thus, a movement of the seal member **51** in the axial direction is regulated.

As described above, according to the shield connector of the first embodiment, since the tubular seal member **51** is provided that simultaneously seals the part between the inner periphery of the insert hole **13***a* of the case **13** and the outer periphery of the inner sheath **16** forming the shield electric wire **14** and the part between the inner periphery of the shield terminal **31** and the outer periphery of the inner sheath **16** of the shield electric wire **14**, a cost can be more lowered by the decrease of the number of component parts than a case that seal members for sealing the above-described parts are respectively provided. Further, an inconvenience can be eliminated that the plurality of seal members are used to enlarge the insert hole **13***a* of the case **13** and deteriorate a shield performance.

Further, when the crimping terminal **19** is fixed to the core wire **15** exposed in an end part of the shield electric wire **14**, a separate member made of an insulating material is not provided between the shield terminal **31** and the crimping terminal **19**, nor the shield terminal **31** is greatly separated from the crimping terminal **19** so that an insulation between the shield terminal **31** and the crimping terminal **19** may be ensured by the seal member **51** and the shield performance may be improved. Thus, the increase of the cost due to a provision of the separate parts can be suppressed and an inconvenience can be eliminated that the shield terminal **31** is greatly separated from the crimping terminal **19** to lead to an enlargement.

Further, since the annular member **55** made of the resin and formed integrally with the seal member **51** is engaged, in the engagement of the recessed and protruding parts, with the shield terminal **31**, the seal member **51** can be held at a prescribed position and a good sealing state by the seal member **51** can be maintained.

Further, since the annular member **55** which is engaged, in the engagement of the recessed and protruding parts, with the shield terminal **31** is provided in the intermediate part of the seal member **51** in the axial direction, the seal member **51** can be held at the prescribed position with a good balance and the good sealing state can be obtained.

Especially, since the seal member **51** is symmetrically formed with respect to the intermediate part in the axial direction as a boundary where the annular member **55** is provided, directional characteristics of the seal member **51** can be eliminated and an attaching operation can be easily carried out.

Further, since the intermediate part of the seal member **51** is compressed, when the inner sheath **16** of the shield electric wire **14** is inserted to the seal member **51**, the seal parts **52** and **53** of the seal member **51** are easily deformed. Accordingly, an inserting operation of the inner sheath **16** of the shield electric wire **14** can be easily achieved.

Further, since the seal member **51** is provided with the annular member **55** made of the resin, when the seal member **51** is attached to the shield terminal **31**, the annular member **55** harder than other parts can be gripped and pushed in to fit the seal member to the shield terminal **31**.

Now, a shield connector according to a second embodiment will be described below.

The same components as those of the first embodiment are designated by the same reference numerals and a description thereof will be omitted.

As shown in FIGS. **9** and **10**, in a shield connector **11**, a seal member **61** different from the first embodiment is provided.

The seal member **61** is also formed with, for instance, an elastic material such as rubber. As shown in FIGS. **11**A, **11**B, **12**A and **12**B, the seal member has two annular seal parts **62** and **63** whose thickness is large. The seal part **62** has lip parts **62***a* and **62***b* which gradually protrude to an outer peripheral side and an inner peripheral side. The seal part **63** also has lip parts **63***a* and **63***b* which gradually protrude to an outer peripheral side and an inner peripheral side similarly to the seal part **62**.

The seal member **61** has a part between the seal parts **62** and **63** as an intermediate part in the axial direction formed as a compressed part **64** whose thickness is reduced.

Further, in the seal member **61**, an annular member **65** is formed integrally in an end part of an inserting side of a shield electric wire **14**.

The annular member **65** is formed with a synthetic resin such as plastic and formed in the shape of L in section. In the annular member **65**, an engaging protrusion **66** is formed in the inserting side of the shield electric wire **14** in an outer peripheral side thereof. Further, in a shield terminal **31**, engaging protrusions **34** are not formed in an inner periphery of an annular engaging protrusion **33**, but in the vicinity of a stepped part **38** in an inner periphery of a tubular part **37**. The engaging protrusions **34** are engaged with the engaging protrusion **66** of the seal member **61**. Thus, a movement of the seal member **61** in the axial direction is regulated.

Further, the annular member **65** includes a true circle forming part **67** in an inner peripheral side thereof. The true circle forming part **67** includes a plurality of protrusions **68** protruding inward in the diametrical direction and arranged in the circumferential direction. The protrusions **68** respectively have, in the inserting side of the shield electric wire **14**, guide surfaces **68***a* gradually inclined in the inserting direction of the shield electric wire **14** inward in the diametrical direction.

Then, in the true circle forming part **67**, an outer peripheral surface of an inner sheath **16** exposed from the inserted shield electric wire **14** is pushed in to a central part respectively by the guide surfaces **68***a* of the protrusions **68**. Thus, even when the inner sheath **16** of the shield electric wire **14** is slightly deformed to be flat in its shape, the inner sheath **16** is inserted into the true circle forming part **67** so that the inner sheath **16** is guided to the seal member **61** under a state an outer form of the outer sheath **16** is forcedly configured to a true circle.

An inside diameter of the true circle forming part **67** is set to be slightly larger than an outside diameter of the inner sheath **16** so as not to give an influence to a smooth insertion of the inner sheath **16** of the shield electric wire **14**.

As described above, according to the shield connector of the second embodiment, since the tubular seal member **61** is provided that simultaneously seals a part between the inner periphery of an insert hole **13***a* of a case **13** and the outer periphery of the inner sheath **16** forming the shield electric wire **14** and a part between the inner periphery of the shield terminal **31** and the outer periphery of the inner sheath **16** of the shield electric wire **14**, a cost can be lowered by the

decrease of the number of component parts. Further, an inconvenience can be eliminated that a shield performance is deteriorated.

Further, by the seal member **61**, insulation between the shield terminal **31** and a crimping terminal **19** can be ensured and the shield performance can be improved.

Especially, since the inner sheath **16** forming the shield electric wire **14** is inserted into the seal member **61**, even when the inner sheath **16** of the shield electric wire **14** is somewhat deformed, the outer form of the inner sheath **16** of the shield electric wire **14** can be configured to the true circle by the true circle forming part **67** of the annular member **65**. Thus, the seal member **61** can be allowed to come into close contact with the inner sheath **16** of the shield electric wire **14** with a good balance to obtain a good sealing state.

The present invention is not limited to the above-described embodiments, and may be suitably modified and improved. Additionally, any of materials, forms, dimensions, numbers and arranged positions of the components in the above-described embodiments which can achieve the present invention may be arbitrarily employed without a limitation.

The present application is based on Japanese Patent Application No. 2010-196711 filed on Sep. 2, 2010, the contents of which are incorporated herein by way of reference.

INDUSTRIAL APPLICABILITY

The present invention is extremely useful in providing the shield connector may be provided which can obtain a high shield performance and a high sealing performance without enlarging the shield connector and increasing the cost.

REFERENCE SIGNS LIST

11 shield connector
13 case (objective body)
13*a* insert hole
14 shield electric wire
15 core wire
16 inner sheath
17 shield layer
18 outer sheath
21 housing
31 shield terminal
51, **61** seal member
55, **65** annular member
67 true circle forming part

The invention claimed is:

1. A shield connector, to which a shield electric wire including an inner coating, a shield layer and an outer coating provided in this order in a periphery of a core wire is connected, attached to a grounded objective body to guide the shield electric wire to an insert hole formed in the objective body, and electrically conduct the shield layer to the objective body, the shield connector comprising:

a housing, having a tubular shape so that the shield electric wire is inserted thereinto, and attached to the objective body so as to communicate with the insert hole of the objective body;

a shield terminal, having a tubular shape, being electrically conductive, attached to an inner peripheral side of the housing, and electrically conducted to the objective body and the shield layer; and

a seal member, having a tubular shape, abutting an inner periphery of the insert hole and the shield electric wire, provided between the shield terminal and the shield electric wire, and configured to seal a part between the inner periphery of the insert hole and an outer periphery of the shield electric wire, and seal a part between an inner periphery of the shield terminal and the outer periphery of the shield electric wire.

2. The shield connector according to claim **1**, wherein

an annular member made of a resin is provided integrally in the seal member, and

the annular member is engaged with the shield terminal.

3. The shield connector according to claim **2**, wherein

the annular member is provided in an intermediate part of the seal member in an axial direction of the seal member.

4. The shield connector according to claim **2**, wherein the annular member has a true circle forming part configured to forcibly form an outer form of the inserted shield electric wire to a true circle.

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